

CLAIMS

What is claimed is:

1. A link layer device including at least one unique identifier associated therewith, an input data line for receiving a plurality of received data packets, each of the plurality of data packets including a destination identifier and a plurality of data, the link layer device comprising:

a data receiver coupled to the input data line;

a channel mapper coupled to the data receiver;

a received data FIFO coupled to the channel mapper;

a feed-forward data FIFO coupled to the channel mapper;

the channel mapper receiving the plurality of received data packets and being configured and arranged to divert the received data packets, having a destination identifier equivalent to the unique destination identifier, to the received data FIFO, and to divert the remaining plurality of received data packets to the feed-forward data FIFO;

a transmitter data FIFO containing a plurality of data packets to be transmitted, each of the plurality of data packets to be transmitted having a destination identifier and a plurality of data; and

a data transmitter having an output coupled to an output data line, and an input coupled to the feed-forward data FIFO and to the transmitter data FIFO, the data transmitter configured and arranged to retrieve data packets from the feed-forward data FIFO and the transmitter data FIFO and to transmit the retrieved data packets on the output data line.

2. The link layer device of claim 1 further including an egress processor coupled to the received data FIFO and further coupled to a plurality of data ports, the egress processor configured and arranged to provide the received data packets contained in the received data FIFO to one of the plurality of data ports.

3. The system packet interface of claim 1 further including a data ingress processor coupled to the transmitter data FIFO and further coupled to a plurality of data ingress lines, the ingress processor configured and arranged to receive a plurality of data packets from the plurality of data ingress lines and to provide the received plurality of data packets as a plurality of data packets to be transmitted to the transmitter data FIFO.

4. The system packet interface of claim 1 wherein the output data line includes a plurality of output data lines.

5. The system packet interface of claim 1 wherein the input data line includes a plurality of input data lines.

6. The system packet interface of claim 1 wherein the data transmitter is further coupled to a status line corresponding to the data output line and providing status indicia of a "data pass" "data no-pass" condition on the corresponding data output line, in the event the status indicia is "data no-pass" the data transmitter responsive to the status indicia by stopping transmission of data on the corresponding output data line, in the event the status indicia is "data pass" the data transmitter responsive to the status indicia by continuing transmission of data on the corresponding output data line.

7. A system for aggregating a plurality of input and output ports to a data device, the data device including a data output port and a data input port, the data device having a maximum data rate, the system comprising:

first and second link layer devices, each link layer device including:

an assigned unique destination identifier, an input data line for receiving a plurality of received data packets, each of the plurality of data packets including a destination identifier and a plurality of data;

5 a data receiver coupled to the input data line;
a channel mapper coupled to the data receiver;
a received data FIFO coupled to the channel mapper;
a feed-forward data FIFO coupled to the channel mapper;
the channel mapper receiving the plurality of received
10 data packets and being configured and arranged to divert the received data packets, having a destination identifier equivalent to the assigned destination identifier, to the received data FIFO, and to divert the remaining plurality of received data to the feed-forward data FIFO;

5 a transmitter data FIFO containing a plurality of data packets to be transmitted, each of the plurality of data packets to be transmitted having a destination identifier and a plurality of data;

20 a data transmitter having an output coupled to an output data line, and an input coupled to the feed-forward data FIFO and to the transmitter data FIFO, the data transmitter configured and arranged to retrieve data packets from the feed-forward data FIFO and the transmitter data FIFO and to transmit the retrieved data packets on the output data line;

25 an egress processor coupled to the received data FIFO and further coupled to a data output port, the egress processor configured and arranged to provide the received data packets contained in the received data FIFO to the data output ports;

30 a data ingress processor coupled to the transmitter data FIFO and further coupled to a data input port, the ingress processor configured and arranged to receive a plurality of data packets from the data input port and to provide the received

plurality of data packets, as a plurality of data packets to be transmitted, to the transmitter data FIFO;

the input data line of the first link layer device coupled to the output port of the data data device;

5 the output data line of the of the first link layer device being coupled to the input line of the second link layer device;

the output data line of the second link layer device being coupled to the input port of the data device;

wherein, the aggregate data rate of the first and second
10 link layer devices is less than the maximum data rate of the data device.

8. The system of claim 7 further including a first status signal provided by the second link layer device, the first status signal coupled to a status line corresponding to the data output line and providing status indicia of a "data pass" "data no-pass" condition on the corresponding data output line; and

the status line coupled to the data transmitter of the first link layer device, in the event the status indicia is "data no-pass" the data transmitter of the first link layer device being responsive to the status indicia by stopping transmission of data on the corresponding output data line, in the event the status indicia is "data pass" the data transmitter of the first link layer device being responsive to the status indicia by continuing
25 transmission of data on the corresponding output data line.

9. The system of claim 8, wherein the status signal is generated by the received data FIFO and the feed-forward data FIFO and is indicative of the amount of data stored respectively
30 therein.

10. The system of claim 7 wherein the data device is selected from the group of network processor, physical layer device, and link layer device.

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